Additional Information from the Formula Sheet

$\bar{x}$ = mean

n = size of the sample

Record your calculated means in the table given below.

(Nearest whole #)

	# of Na+ ions entering the TTX nerve cells	# of Na+ ions entering the normal nerve cells
$\bar{x}$ (Mean)	35/5 = 7	331/5 = 66.2 → 66

2. Use the data in the chart on the previous page to calculate the **standard deviation** for each set of data.

Why use this formula?

Use standard deviation formula to determine the amount by which your values (data points) typically differ from the mean value. In other words, the standard deviation determines the amount of variation in your data.

Formula

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n - 1}}$$

Additional Information from the Formula Sheet

$\bar{x}$ = sample mean

n = size of the sample

s = sample standard deviation (i.e., the sample-based estimate of the standard deviation of the population)

(Nearest hundredth)

Record your work in row 1 of the table below, and record your calculated standard deviations in row 2 of the table given below.

	# of Na+ ions entering the TTX nerve cells	# of Na+ ions entering the normal nerve cells
Work	$\sqrt{\frac{[(10-7)^2+(3-7)^2+(7-7)^2+(4-7)^2+(11-7)^2}{5-1}}$ $\sqrt{\frac{9+16+0+9+16}{4}} = 3.54$	$\sqrt{\frac{[(66-62)^2+(74-66)^2+(65-66)^2+(69-66)^2 (61-66)^2}{5-1}}$ $\sqrt{\frac{16+64+1+9+25}{4}} = 5.36$
s (standard deviation)	3.54	5.36

3. Use the standard deviations you calculated to find the **standard error of the mean (SEM)** for each set of data.

Why use this formula?

Use the standard error formula to determine the precision of the mean value. In other words, we are determining how confident we are in our mean value by considering both the standard deviation (s) and the number of data points (n). Typically, when we have more data points, we can be more confident in our data (i.e. a lower standard error).